

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion is respectfully requested.

Claims 1-21 are pending in this case. Claims 9, 10, 18 and 21 are amended by the present Amendment. Support for amended Claims 9, 10, 18 and 21 can be found in the original specification, claims and drawings.¹ No new matter has been added.

In the outstanding Official Action, the drawings are objected to; Claims 18-20 were rejected under 35 U.S.C. 102(e) as anticipated by Kokai et al. (Japanese Patent No. 11-45125, hereinafter “Kokai”); Claims 1-9, 11-17 and 21 were rejected under 35 U.S.C. 103(a) as unpatentable over Kokai; and Claim 10 was rejected under 35 U.S.C. 103(a) as unpatentable over Kokai in view of Maulik (U.S. Patent No. 6,133,719).

Claims 18-20 were rejected under 35 U.S.C. 102(e) as being anticipated by Kokai. Applicant respectfully submits that amended independent Claim 18 states novel features clearly not taught or rendered obvious by the applied reference.

Amended Claim 18 relates to a reference power supply circuit including, *inter alia*, a mirror circuit having first, second, third and fourth nodes. The first node is connected to a P type semiconductor area of a first PN junction, and the second node is connected to a first resistive element. The third node is connected to a control gate of a current supply, and the fourth node is connected to a second potential. The mirror circuit is configured to allow a current which flows through the first PN junction to be copied to a corresponding current through the first and a second resistive elements and a second PN junction, and to control the current supply in accordance with the current through the first and second resistive elements and the second PN junction.

¹ Specification at Fig. 6, and p. 16, lines 25-27, and Fig. 16.

The mirror circuit, as recited in amended Claim 18 does not have a voltage gain as a differential amplifier, and therefore the circuit does not require a mechanism for preventing the circuit from oscillating.

Turning to the applied reference, Fig. 20 of Kokai describes a plurality of transistors, N20 and N21, that form a mirror circuit. However, in contrast to amended Claim 18, the source and gate of transistor N20 and the gate of transistor N21 are connected to transistor P3. The source of transistor N21 is set as an output end of electric current I_{ref} , and the drains of transistors N20 and N21 are connected to the ground. Thus, the mirror circuit described in Fig. 20 of Kokai completely differs in configuration from that recited in amended Claim 18.

Accordingly, Applicant respectfully requests that the rejection of Claim 18 under 35 U.S.C. 102 be withdrawn. As Claims 19-21 depend from amended Claim 18, it is also submitted that these claims patentably define over Kokai.

Claims 1-9, 11-17 and 21 were rejected under 35 U.S.C. 103(a) as unpatentable over Kokai. Applicant respectfully traverses this rejection as independent Claim 1 and amended independent Claim 9 state novel features clearly not taught or rendered obvious by the applied references.

Claim 1 relates to a reference power supply circuit including, *inter alia*, a first current supply which is connected to a P-type semiconductor area of a first PN junction and supplies a current only to the first PN junction. One end of a first resistive element is connected to a P-type semiconductor area of a second PN junction, and a second resistive element is connected in parallel with the first resistive element and the second PN junction. A second current supply is inserted between the first resistive element and a second potential, and a third current supply is connected between the second potential and an output terminal. The power supply circuit also includes a differential amplifier which receives, at an inverting

input terminal, a potential on a first connection point between the first current supply and the first PN junction and, at a non-inverting input terminal, a potential on a second connection point between the second current supply and the first resistive element. The differential amplifier controls the first, second and third current supplies by a difference in potential between the inverting input terminal and the non-inverting input terminal.

As discussed above, Claim 1 recites that the first current supply supplies a current only to the first PN junction. Thus, the first PN junction is not connected to a resistive element, and if the size ratio of the first PN junction and the second PN junction is held, there is no variation in temperature characteristics. By using this claimed configuration, the size of the first PN junction and the second PN junction can be reduced.

Further, if a resistor connected in parallel to the first PN junction is eliminated, as shown in Fig. 3 and at page 16, lines 4-20 of the specification, the crossing angle made at a crosspoint of operation curves CA and CB of the first and second connection points (nodes) increases. Therefore, even if there is a variation in a threshold voltage of a transistor in an input stage of a differential amplifier, it is possible to reduce errors of output currents of the first, second and third current supplies controlled by the differential amplifier and a stable reference voltage can be generated.

In addressing the above-noted features of Claim 1, the outstanding Official Action states that Kokai does not “disclose that the first current supply is supplying current only to the first PN junction”, but asserts that Fig. 13 of Kokai “teaches that it is well known in the art to apply a current source only to a PN junction” and that Fig. 13 does not include a resistor.²

However, Fig. 13 of Kokai is further deficient in that it does not teach or suggest a “second resistive element”, or any equivalent thereof, as recited in Claim 1. Further, the

² Outstanding Official Action at p. 3.

circuit shown in Fig. 13 of Kokai includes differential amplifier DA2, transistors Tr4 and Tr5 and resistor R3a. The circuit shown in Fig. 13 of Kokai is further characterized by including variable resistors R2a and R3a for current voltage conversion and, by changing the resistance values of the variable resistors, temperature characteristics can be adjusted and output voltages and of different levels can be selectively output. Thus, the circuit shown in Fig. 13 of Kokai greatly differs in configuration from that recited in Claim 1.

Thus, it would not have been obvious at the time of the invention for a person having ordinary skill in the art to arrive at the features recited in Claim 1 based on the circuit shown in Fig. 13 of Kokai. Such modification would require a substantial reconstruction or redesign of the elements of the Kokai's device, and would change the basic principle of operation of the Kokai's circuit. There is no evidence that a person of ordinary skill in the art would be motivated to perform such changes and redesign.³

Fig. 2, Kokai shows a circuit for solving a problem of the circuit in Fig. 20. The circuit depicted in Fig. 2 fails to teach or suggest a “second resistive element”, or equivalent thereof, as recited in Claim 1 of the present application. Further, differential amplifier DA2, transistors P4 and P5, and resistor R3 are added to the circuit in Fig. 2. Fig. 5 (the second embodiment) of Kokai shows an improvement of the circuit in Fig. 2. Specifically, the circuit shown in Fig. 5 corresponds to a conventional reference voltage generation circuit shown in Fig. 17 of the present application. The circuit recited in Claim 1 is a further improvement of the circuit shown in Fig. 5 of Kokai, and has significant advantages, as described above, in comparison with the circuit of Kokai. Thus, Claim 1, and for

³ See In re Ratti, 270 F.2d 810, 813, 123 USPQ 349, 352 (reversing an obviousness rejection where the “suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.”)

substantially similar reasons, amended Claim 9 is not obvious based on Figs. 20 and 13 of Kokai.

Further, amended Claim 9 recites that the differential amplifier is a “source follower” differential amplifier. Kokai fails to teach or suggest the use of a source follower type differential amplifier, whatsoever. Upon encountering an increase in temperature, the source follower differential amplifier shifts in a direction where an input voltage becomes higher. Alternatively, when a temperature becomes higher, the voltage across the first and second PN junctions becomes lower. Therefore, the source follower type differential amplifier can compensate for a reduction in the output voltage of the first and second PN junctions. Since Kokai fails to teach or suggest the a “source follower” differential amplifier or that any advantages obtained by such an amplifier are desired in his device, amended Claim 9 is not rendered obvious over Kokai.

Accordingly, for at least the reasons discussed above, Applicant respectfully requests that the rejection of independent Claims 1 and 9 under 35 U.S.C. 103 as unpatentable over Kokai, be withdrawn.

Claim 10 was rejected under 35 U.S.C. 103(a) as unpatentable over Kokai in view of Maulik. As discussed above, Kokai fails to teach or suggest a differential amplifier, which is a “source follower” type differential amplifier. Likewise, Maulik fails to remedy this deficiency, and therefore none of the cited references, neither alone nor in combination, teach or suggest Applicant’s Claim 10, which includes the above-distinguished features by virtue of dependency. Therefore, the outstanding Official Action does not provide a *prima facie* case of obviousness with regard to this claim.

Accordingly, Applicant respectfully requests that the rejection of Claim 10, under 35 U.S.C. 103 be withdrawn.

Consequently, in view of the present amendment and in light of the foregoing comments, it is respectfully submitted that the invention defined by Claims 1-21 is patentably distinguishing over the applied references. The present application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of the application is therefore requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAYER & NEUSTADT, P.C.



Eckhard H. Kuesters
Attorney of Record
Registration No. 28,870

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

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